

IN THE SPECIFICATION

Please insert the following paragraph at the beginning of the specification:

“This application is a continuation application of pending United States patent application serial number 10/348,799 filed January 21, 2003, which is a continuation application of United States patent application serial number 09/943,615 filed August 30, 2001, now issued as United States patent number 6,546,347 B2.”

Paragraph 08:

~~A method and an apparatus for setting a predetermined clearance in an internal combustion engine between a rocker arm and a rocker arm actuated engine component are disclosed. The rocker arm is rotatably mounted on a rocker shaft for reciprocating movement relative thereto, and the rocker arm has a first end located on a first side of the rocker shaft and a second end located on a second side of the rocker shaft. The first end of the rocker arm has an adjustment screw extending therethrough to act on an end of a push rod. The second end of the rocker arm is movable in a first, component actuating, direction and in a second direction opposite to the first direction and has a component engaging surface co-operating with a portion of the rocker arm actuated engine component. At least a portion of the rocker arm actuated engine component is biased in the second direction towards a first position and is movable against the bias in the first direction towards a second position.~~

In one aspect of the present disclosure, a method of setting a predetermined clearance in a component drive train of an internal combustion engine includes: rotating an adjustment screw to adjust a position of a component engaging surface associated with a rocker arm from a reference datum position to a first reference position; rotating the adjustment screw through a predetermined reference angle and recording a second reference position of the component engaging surface; calculating a coefficient from the difference between the first and second reference positions and the reference angle; calculating an amount of angular rotation of the adjustment screw corresponding to a predetermined clearance between the component engaging surface and the reference datum using the coefficient, and rotating the adjustment screw the calculated amount of angular rotation to set the predetermined clearance relative to the reference datum.

Paragraph 09:

~~In one aspect of this invention, a method for setting a predetermined clearance between a rocker arm and a rocker arm actuated engine component comprises the steps of (a) setting the rocker arm to a zero position and recording the zero position as a reference datum; (b) rotating the adjustment screw to adjust the position of the rocker arm to a first reference position; (c) rotating the adjustment screw through a reference angle and recording a corresponding second reference position thereof; (d) calculating a coefficient from the difference between the first and second reference positions and the reference angle; (e) using the coefficient to calculate and angular rotation of the adjustment screw corresponding to the predetermined clearance; and (f) rotating the adjustment screw on the basis of the calculated angular rotation to set the predetermined clearance relative to the reference datum.~~

In another aspect of the present disclosure, an apparatus for setting a predetermined clearance in a component drive train of an internal combustion engine having a rocker arm, a component engaging surface connected to the rocker arm, and an adjustment screw, is provided. The apparatus has an electronic controller, an actuator operatively connected to the electronic controller and adapted to move the component engaging surface in response to the controller, a position sensor operatively connected to said electronic controller and being adapted to sense the position of the component engaging surface, the electronic controller is adapted to record the position of the component engaging surface, and an adjustment screw rotator is responsive to the electronic controller to selectively rotate the adjustment screw and change the position of the component engaging surface. The electronic controller is programmed to cause the component engaging surface to set to a zero position and record the zero position as a reference datum, to cause the adjustment screw rotator to rotate the adjustment screw to adjust the position of said component engaging surface to a first reference position and then rotate the adjustment screw through a reference angle, to record a corresponding second reference position of the component engaging surface, to calculate a coefficient from the difference between the first and second reference positions and the reference angle, to use the coefficient to calculate an angular rotation of the adjustment screw corresponding to a predetermined clearance, and to cause the adjustment

screw rotator to rotate the adjustment screw on the basis of the calculated angular rotation to set the predetermined clearance relative to the reference datum.

Paragraph 10:

In another aspect of this invention, an apparatus for setting a predetermined clearance between a rocker arm and rocker arm actuated engine component comprises an electronic controller, a rocker arm actuator responsive to the electronic controller to selectively rotate the rocker arm relative to the rocker shaft, a rocker arm position sensor operably connected with the electronic controller to record with the electronic controller the position of the second end of the rocker arm, and an adjustment screw rotator responsive to the electronic controller to selectively rotate the rocker arm adjustment screw. The electronic controller is programmed to (a) cause the rocker arm actuator to set the rocker arm to a zero position and record the zero position as a reference datum, (b) cause the adjustment screw rotator to rotate the adjustment screw to adjust the position of the rocker arm to a first reference position and then rotate the adjustment screw through the reference angle, (c) record a corresponding second reference position of the rocker arm, (d) calculate a coefficient from the difference between the first and second reference positions and the reference angle, (e) use the coefficient to calculate an angular rotation of the adjustment screw corresponding to the predetermined clearance, and (f) cause the adjustment screw rotator to rotate the adjustment screw on the basis of the calculated angular rotation to set the predetermined clearance relative to the reference datum.

In yet another aspect of the present disclosure, a method of automatically setting a predetermined clearance in an engine valve drive train of an internal combustion engine includes: moving a rocker arm relative to a push rod and eliminating a backlash associated with a push rod and rocker arm; rotating an adjustment screw and setting a predetermined amount of backlash between the rocker arm and an engine valve; applying a predetermined force to a lock nut threadably connected to the adjustment screw, rotating the lock nut in first direction, and tightening said lock nut to the predetermined force relative to said rocker arm; and rotating the adjustment screw in the first direction and correcting a

change in an amount of backlash from the predetermined amount of backlash caused by applying the predetermined force to the lock nut to the predetermined amount of backlash.

Paragraph 32:

Next (FIG. 3I, step 62 in FIG. 1), the lock nut 21 is tightened slightly (“snugged”) by a predetermined force applied by the machine tool 30. This induces a slight additional movement of the rocker arm 10 in the second direction B. To compensate for this, the adjustment screw 18 (FIG. 3J) is rotated in its second first angular direction until the second end 16 of the rocker arm 10 is displaced by a small predetermined correction distance d in the direction A relative to the zero position. The distance d is an arbitrary small value that is just large enough to be measured accurately by the position sensor 28, typically of the order of 0.03 mm (point 63 in FIG. 1). This step is not required if the adjustment screw does not have a lock nut.

Paragraph 34:

The adjustment screw 18 is then rotated in its second angular direction through the angle R to achieve the desired clearance C between the rocker face 22 and the end 24 of the valve stem 26, thus setting the required valve clearance gap (FIG. 3LK, point 66 in FIG. 1). The lock nut 21 is then tightened fully by applying a predetermined force thereto. Finally, the clearance is checked using the linear position sensor 28 to ensure that the clearance is within the required tolerance relative to the zero position (FIG. 3L, point 68 in FIG. 1).